National Health Workforce Data Set: nursing and midwifery workforce 2012: National Health Workforce Data Set, 2012; Data Quality Statement

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Identifying and definitional attributes

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Data quality

Data quality statement summary:

Summary of key issues

The NHWDS: nurses and midwives 2012 contains information on the demographics, employment characteristics, primary work location and work activity of nurses and midwives in Australia who renewed their registration via the National Registration and Accreditation Scheme (NRAS) introduced on 1 July 2010.

This is the second data set published for nurses and midwives from the new national registration scheme. The data set is comprised of registration information provided by the AHPRA and workforce details obtained by surveys.

This data quality statement should be read in conjunction with the footnotes and commentary accompanying tables and graphs throughout the publication.

Description

The NHWDS: nurses and midwives 2012 is a combination of data collected through the nurse and midwife registration renewal process.

Registration data

All nurses and midwives must be registered with the AHPRA to practise in Australia. Nurses and midwives (see Box 1.3) are required by law to renew their registration through the NRAS, either online via the AHPRA website or using a paper form provided by the AHPRA. For initial registration, practitioners must use a paper form and provide supplementary supporting documentation.

Whether for renewal or initial registration, this information is referred to as 'registration data'. Data collected includes demographic information such as age, sex and country of birth; and details of health qualification(s) and registration status. This is the compulsory component of the registration process.

Registration details on NHWDS: nurses and midwives 2012 were collected either from the compulsory registration renewal form, from new registrations or from registration details migrated from the respective state and territory health boards before their dissolution. Copies of registration forms for new registrants are available on the relevant board websites, which can be accessed from the AHPRA website http://www.ahpra.gov.au/.

Between 2011 and 2012, there was a drop in midwife registrations, from 39,998 to 35,362. This was due to a drop in dual midwife/nurse registrations. In regards to this, the 2012-13 Annual report: AHPRA and National Boards states 'The growth in the number of registrants as either a nurse or a midwife is linked to the decrease in numbers with dual registration. Many registrants who held dual registration when the National Scheme began have, over time, chosen to renew their registration in one of the professions. This is likely to be related to the requirement in the National Scheme for registrants to meet the requirements in the registration standards for recency of practice and continuing professional development relevant to each profession when they renew their registration.' (AHPRA 2012d, p 61).

Survey data

When nurses and midwives renew their registration online they are asked to complete an online survey customised for each profession. When nurses and midwives renew their registration using a paper form they are also asked to complete a paper version of the relevant survey.

Copies of the survey forms are available from the AIHW website http://www.aihw.gov.au/workforce-publications/ (select link to Nurses and midwives 2012).

Database creation

The AHPRA stores both the online registration data and the survey information in separate databases. They send these two de-identified data sets to the AIHW, where they are merged into a national data set.

When practitioners renew their registration using a paper form they are also asked to complete a paper version of the relevant survey. The paper registration and survey forms are sent to the AHPRA, where the paper registration forms are scanned and merged with the data obtained from the online process. The AHPRA sends the paper survey forms to HWA to be scanned into a data set. HWA sends this data set to AIHW for merging with registration data and data from the online survey forms, and for cleansing and adjustment for non-response to form a nationally consistent data set. The final data set is then known as the National Health Workforce Data Set: nurses and midwives.

Institutional environment: The AIHW is a major national agency set up by the Australian Government under the Australian Institute of Health and Welfare Act 1987 to provide reliable, regular and relevant information and statistics on Australia's health and welfare. It is an independent statutory authority established in 1987, governed by a management board and accountable to the Australian Parliament through the Health and Ageing portfolio.

The AIHW aims to improve the health and wellbeing of Australians through better health and welfare information and statistics. It collects and reports information on a wide range of topics and issues, ranging from health and welfare expenditure, hospitals, disease and injury, and mental health, to ageing, homelessness, disability and child protection.

The Institute also plays a role in developing and maintaining national metadata standards. This work contributes to improving the quality and consistency of national health and welfare statistics. The Institute works closely with governments and with non-government organisations to achieve greater adherence to these standards in administrative data collection to promote national consistency and comparability of data and reporting.

One of the main functions of the AIHW is to work with the states and territories to improve the quality of administrative data and, where possible, to compile national data sets based on data from each jurisdiction; to analyse these data sets; and to disseminate information and statistics.

Compliance with the Australian Institute of Health and Welfare Act 1987 and the Privacy Act 1988 (Cwlth) ensures that the data collections managed by the AIHW are kept securely and under the strictest conditions with respect to privacy and confidentiality. For further information, see the AIHW website <http://www.aihw.gov.au>.

The AHPRA is the organisation responsible for the implementation of the NRAS across Australia. The AHPRA works with the National Health Practitioner Boards to regulate health practitioners in the public interest and to ensure a competent and flexible health workforce that meets the current and future needs of the Australian community.

HWA are responsible for the development of the workforce surveys.

The AIHW receives registration information on allied health practitioners via the mandatory national registration process administered by the AHPRA and voluntary survey data collected at the time of registration renewal. The registration and survey data are combined, cleansed and adjusted for non-response to form a national data set known as NHWDS: nurses and midwives 2012.

The AIHW is the data custodian of the NHWDS: nurses and midwives 2012.

Timeliness: The NHWDS: nurses and midwives is created annually throughout the national registration renewal process, which is conducted between 1 April and 31 May each year. Although the reference time is notionally the renewal date, legislation allows for a 1 month period of grace. Thus, the final registration closure date is 1 month after the renewal date. The AHPRA allows a further 2 weeks to allow for mail and data entry delays before registrations are considered expired. Consequently the extraction of data occurs a month and a half after the renewal date ('the extraction date').

The survey data are also collected between 1 April and 31 May, as the survey is administered as part of the registration renewal process.

Due to significant delays with release of data from the new national registration system, complete and final data were provided to the AIHW much later than originally scheduled.

The data needed joint reviews by the AHPRA, the AIHW and HWA to manage the range of considerations and data quality issues. This review process improved data quality, data definitions, metadata and data cleansing. The process also led to improvements in the AHPRA's extracting scripts to provide consistency in data exchange specifications. This process delayed the supply of data but improved the overall quality. HWA has provided funding and assistance to the AHPRA to improve their survey tool infrastructure, thereby improving timeliness and quality of data provision in the future.

The AIHW did not receive complete data for 2012 until May 2013, with data initially having been expected in July 2012. The AHPRA have indicated that future data provision is anticipated to be timely and to be provided six weeks from the close of registration on 31 May.

Accessibility: Results from the NHWDS: nurses and midwives 2012 are published in the Nursing and midwifery workforce 2012 report. The report and workforce survey questionnaires are available from the AIHW website http://www.aihw.gov.au/workforce-publications/ (select link to Nurses and midwives workforce 2012).

Users can request data not available online or in reports via the Media and Strategic Engagement Unit on (02) 6244 1032 or via email to info@aihw.gov.au. Requests that take longer than half an hour to compile are charged for on a cost-recovery basis.

Access to the master unit record files may be requested through the AIHW Ethics Committee.

HWA provides a data tabulation tool, including data from the National health workforce dataset, on their website http://www.hwa.gov.au/work-programs/information-analysis-and-planning/health-workforce-data.

Interpretability: Descriptions of data items in the National Health Workforce Data Set: nurses and midwives 2012 are available on request from the Expenditure and Workforce Unit at the AIHW.

The surveys used by nurses and midwives are available from the AIHW website <http://www.aihw.gov.au/workforce-publications/> (select link to Nurses and midwives 2012).

Relevance:	**Scope and coverage**

The primary purpose of the National Health Workforce Data Set: nurses and midwives 2012 is to provide information on the number and the demographic and employment characteristics of nurses and midwives in Australia.

The NHWDS: nurses and midwives 2012 is relevant for understanding the size and characteristics of the nursing and midwifery workforce in Australia. It is therefore highly relevant for health agencies involved in workforce planning as well for health policy planning and implementation in general.

The location and distribution of the workforce, as well as demographic details such as age and sex of nurses and midwives, are useful for workforce planning within states and territories and nationally. Information on qualifications is relevant for the relevant professional associations and for educational planning.

Accuracy:	**Estimation procedures**

The AIHW uses registration data together with survey data to derive estimates of the total nursing and midwifery workforce. Not all nurses and midwives who receive a survey respond, because it is not mandatory to do so. In deriving the estimates, two sources of non-response to the survey are accounted for:

- item non-response—occurs as some respondents return partially completed surveys. Some survey records were so incomplete that it was decided to omit them from the reported survey data.
- survey non-response—occurs because not all registered nurses and midwives who receive a questionnaire respond.

A separate estimation procedure is used for each. Imputation is used to account for item non-response and weighting is used for survey non-response.

Imputation: estimation for item non-response

The imputation process involves an initial examination of all information provided by a respondent. If possible, a reasonable assumption is made about any missing information based on responses to other survey questions. For example, if a respondent provides information on hours worked and the area in which they work, but leaves the workforce question blank, it is reasonable to assume that they were employed.

Missing values remaining after this process are considered for their suitability for further imputation. Suitability is based on the level of non-response to that item. Imputation is usually applied only in cases where the proportion of missing values is less than 5% of the total.

In imputation, the known probabilities of particular responses occurring are used to assign a response category value to each record, using a random number generator. Imputed values are based on the distribution of responses occurring in the responding sample. Therefore, fundamental to imputing missing values for survey respondents who returned partially completed questionnaires is the assumption that respondents who answer various questions are similar to those who do not.

Age and sex values within each state and territory of principal practice are first imputed to account for missing values. Other variables deemed suitable for this process were then imputed. These include hours worked in the week before the survey and principal role of main job.

Weighting: estimation for population non-response

Each survey record (or respondent) is assigned a weight that is calibrated to align with independent data on the population of interest, referred to as 'benchmarks'. In principle, this weight is based on the population number (the benchmark) divided by the number in the responding sample. The resulting fraction becomes the expansion factor applied to the record, referred to as the 'weight', providing an estimate of the population when aggregate output is generated. Therefore, the weight for each record is based on particular characteristics that are known for the whole population.

The total number of registered nurses and midwives in each profession is used to benchmark the survey.

The calculation of weights is usually part of the data processing for a sample survey in which the sample is selected before the survey is done. In the 2012 surveys of nurses and midwives, all renewing registrants were sent a workforce survey questionnaire when registration renewal was due. Therefore, technically, it was a census of nurses and midwives. However, because not all renewing registrants in scope respond to the survey, there is a very large non-response bias in the data. Because the group of respondents in the data set is not random, standard errors are not a suitable means of gauging variability.

The benchmark data used for weighting are the number of registered nurses and midwives in each state and territory (based on the location of principal practice), by age group and by sex within the registration data. Producing estimates for the profession by weighting the data from respondents adjusts for bias in the responding group of nurses and midwives, but only for known population characteristics (such as age and sex, where provided). If information for a variable is not known for the whole population, the variable cannot be used in the calculation of weights and cannot be used in the adjustment process.

For variables not used in the calculation of weights (for the NHWDS: nurses and midwives 2012, that is all variables other than state and territory of principal practice, broad registration category, age and sex), it is assumed, for estimation purposes, that respondents and non-respondents have the same characteristics. If the assumption is incorrect, and non-respondents are different from respondents, then the estimates will have some bias.

The extent of this cannot be measured without obtaining more detailed information about non-respondents. Therefore, there will be some unquantifiable level of bias in the estimates.

Survey responses

The response rates for each of the profession surveys are listed in Table A.1.

Table A1: Survey response rate: state and territory of principal practice[a], 2007 to 2009[b] and 2011 to 2012

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Overseas/ Not stated	Australia
2007	65.5	39.9	33.9	36.7	65.4	59.3	60.0	28.7	. .	49.6
2008[c]	63.4	33.2	32.9	34.4	65.8	56.9	46.9	34.9	. .	46.5
2009[d]	64.0	31.6	28.2	35.4	61.4	33.2	45.1	32.8	. .	44.4
2011	86.9	89.3	91.4	61.6	87.8	74.3	76.9	88.7	76.9	85.1
2012	95.3	93.8	96.0	80.9	94.1	95.1	92.4	92.6	89.2	93.3

(a)   Derived from state and territory of main job where available; otherwise, state and territory of principal practice is used as a proxy. If principal practice details are unavailable, state and territory of residence is used. For records with no information on all three locations, they are coded to 'Not stated'.

(b)   Before 2011, the AIHW Nursing and Midwifery Labour Force Survey collected state and territory of registration and reported in this table. The survey was administered by individual state and territory boards and councils; therefore, some nurses and midwives were registered in more than one jurisdiction.

(c)   Benchmark data for the Australian Capital Territory and Tasmania were not available for 2008 and were estimated from the average of 2007 and 2009 data for both jurisdictions.

(d)   The response rate for the Northern Territory is affected by the transient nature of the nursing work force in that jurisdiction. According to the Nursing Board Annual Report 2009, approximately one-third of all nurses do not re-register each year, primarily because they no longer practise in the jurisdiction. There has been some variation across years in the degree to which nurses who are interstate have been

removed from the renewal process and hence from the survey. Benchmark data for the Northern Territory in 2009 were estimated by using the total from the Nursing Board quarterly bulletin report pro-rated to the 2008 age distribution.

Sources: AIHW Nursing and Midwifery Labour Force Survey, 2007, 2008 and 2009; NHWDS: nurses and midwives 2011.

Data are reported on the basis of the most current address at the time the survey was undertaken, unless stated otherwise. The data include employed nurses and midwives who did not state or adequately describe their location as well as employed nurses and midwives who were overseas. Therefore, the national estimates include these groups.

Coherence: Data collected for NHWDS: nurses and midwives 2012 is comparable with 2011 data, as the same survey data was collected. One minor change was the addition in 2012 of a 'Clinician manager' category in the principal role of main job. Comparisons of clinicians in 2011 need to be made with both clinicians and clinician managers in 2012. There was also a change in population estimates used for calculating full time equivalent rates. In 2011, Estimated Resident Populations (ERPs) based on 2006 census data were used, whereas in 2012, ERPs based on 2012 census data were used. Therefore, the rates based on the two different ERPs are not comparable.

Due to the differences in data collection methods, including differences in the design of surveys and questionnaires, it is recommended that comparisons between workforce data in the NHWDS: nurses and midwives 2011 and 2012 and previous AIHW Nursing and Midwifery Labour Force Survey data be made with caution.

Source and reference attributes

Submitting organisation: Australian Institute of Health and Welfare